Project Baseline Summary Report

Data Source: **EM CDB**

Report Number: **GEN-01b**

Operations/Field Office: **Savannah River**

Print Date: **3/9/2000**

Site Summary Level: **Savannah River Site**

HQ ID: **0592**

Project **SR-HL12 / HLW Removal**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

THE SCOPE OF WORK DESCRIBED IN THIS PROJECT IS WRITTEN FOR FUNDING AT THE PLANNING LEVEL. This is the line item project that has supported the waste removal program since its beginning and will continue to support it through the completion of the waste removal program at SRS in FY28. The project has three major areas of scope: waste removal, vitrification upgrades and East Hill piping upgrades. WASTE REMOVAL activities include retrofitting each waste storage tank with the steel and utilities infrastructure needed to support the pumps and jets used for waste removal;
equipping tanks for water washing and annulus cleaning; and isolating tanks prior to operational closure. Waste removal involves installing sludge or salt removal equipment (typically 3 or 4 slurry pumps and 1 transfer pump) on Tanks 1-7F, 9-15H, 18-19F, 21-24H, 25-28F, 29-32H, 33-34F, 35-39H, 43H, 44-47F; installing sludge processing equipment (steam spargers and gang valves) on Tanks 40 and 51; and consolidating control rooms (FY01-FY14). Physical isolation of a tank prior to operational closure includes cutting, capping and sealing all piping and electrical connections and sealing all openings into the tank. VITRIFICATION UPGRADES will make the necessary modifications to allow DWPF to process sludge with higher source term (FY00-01) and upgrade piping, services and major equipment as needed to ensure continued attainment(FY03-15). EAST HILL PIPING upgrades will replace degraded or failed, buried service piping on the East Hill of H Tank Farm (FY01-05). The new services (steam, air and water) will be mounted on above-grade supports and in covered trenches for Tanks 38-43, the 2H Evaporator, Pump Pits 5 and 6 and Tanks 48-51.
TECHNICAL APPROACH for waste removal includes sludge suspension and salt dissolution by mechanical agitation (slurry pumps); sludge and salt removal via high capacity telescoping transfer pumps and jets. Upgrade scope will employ standard industrial technologies.

Project Status in FY 2006:

Waste removal equipment will be completed on Tanks 4-8, 11, 15, 18, and 19; steam spargers and gang valves will be completed on tanks 40 and 51; and modifications will be completed to Tanks 49 & 50 to support HLW storage. Vitrification upgrades will be completed to enable DWPF to process sludge with higher radioactive source term. East Hill piping upgrades will be completed, including all service piping (steam, air and water) to Tanks 38-43, the 2H Evaporator and Pump Pits 5 and 6.

Post-2006 Project Scope:

Sludge and salt removal scope will be completed on the remaining HLW tanks and all tanks will be isolated thus completing all waste removal project scope by FY28.

Project End State

All scope for this project will be complete by FY28. Actual waste removal, water washing and annulus cleaning, and operational closure of all facilities supported by this project are covered in Waste Removal Operations and Tank Closure (SR-HL03). Disposition is covered by High Level Waste Facilities Disposition (SR-FA24).

Cost Baseline Comments:

The year-to-year fluctuations in costs are due to the project schedules for the 3 sub-projects described above. WASTE REMOVAL expenditures vary

Project Description Narratives

yearly. The tanks which must be readied for waste removal vary with projected operating schedules and feed requirements for the sludge and salt processing and vitrification facilities. Annual expenditures for this line item typically range from $30-$60 million per year through FY28 when the line item is completed. VITRIFICATION UPGRADES scope includes modifications to enable DWPF to process sludge with higher radioactive source term (FY00-01) and continuing maintenance upgrades to ensure attainment (FY03-15). Annual expenditures typically range from $10-20 million per year. EAST HILL PIPING upgrades to failed and degraded, buried piping will be completed from FY01-02. Annual expenditures typically range from $5-$10 million per year.

Safety & Health Hazards:

The main hazard in this facility is from the highly radioactive liquid waste (33 million gallons, 450 million Ci) stored in 46 underground storage tanks. The main radioactive constituents of this waste are Strontium-90, Cesium-137, Plutonium-238, Plutonium-239, and Plutonium-241. The tanks were built underground to provide shielding from the intense radiation fields of this highly toxic waste. This project work is done under radiological conditions to avoid direct personnel exposure and prevent contamination.

Other hazards include exposure to process chemicals (such as nitric acid and sodium hydroxide) as well as miscellaneous hazards commonly encountered in industrial settings (lifting, tripping, falls, rotating equipment, etc.). These hazards are controlled both through engineering controls (hand rails, motor guards, etc.) and through administrative controls (policies and procedures, training, personal protective equipment, etc.).

Safety & Health Work Performance:

All work is performed using a WSRC Integrated Safety Management System (ISMS) approach. The ISMS integrates safety considerations into management and work practices at all levels to accomplish missions while protecting the public, the worker, and the environment. The key elements of the WSRC ISMS are to define the scope of work, identify and analyze hazards associated with the work, develop and implement hazard controls, perform work within controls, and provide feedback on adequacy of controls and continue to improve safety management. The WSRC Integrated Procedures Management System is the primary mechanism for implementing the objective, principles and functions of the ISMS. This system establishes Company-Level, Division-level, and Program-specific procedures consistent with organizational roles, and ensures a consistent, disciplined site-wide approach to safety while performing work.

PBS Comments:

There are some areas of uncertain scope contained in this PBS. The 2nd generation ITP replacement has $150 million (FY98 dollars) allocated between FY11 and FY15. It is not certain whether ITP will be replaced and, if so, what the technology, scope and schedule will be.

The alternative salt removal technology has also not been demonstrated or selected, however, it is assumed that the alternative will be 1/2 the cost of the baseline salt removal technology (3 slurry pumps). The project estimate has been reduced assuming success of technologies yet to be demonstrated.

All other scope is well understood and similar to current ongoing project work at SRS.

Baseline Validation Narrative:

Review by DOE-SR.

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General PBS Information

Project Validated? Yes **Date Validated:** 3/10/1999

Has Headquarters reviewed and approved project? No

Date Project was Added: 12/1/1997

Baseline Submission Date: 7/3/1999

FEDPLAN Project? Yes

Drivers:

CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
N	N	N	N	N	Y	N	N

Project Identification Information

DOE Project Manager: H. B. Gnann

DOE Project Manager Phone Number: 803-208-6076

DOE Project Manager Fax Number: 803-208-7414

DOE Project Manager e-mail address: howard.gnann@srs.gov

Is this a High Visibility Project (Y/N):

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	398,512	1,078,470	1,476,982	22,771	22,771	22,933	22,933	25,127	15,734	38,120	45,024	54,707	59,524	55,431	59,141
PBS Baseline (constant 1999 dollars)	356,561	694,061	1,050,622	22,771	22,771	22,933	22,933	25,127	15,187	35,517	40,846	48,326	51,199	46,425	48,230
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	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	71,570	62,298	77,699	62,162	347,555	229,026	158,238	69,922	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	56,831	48,168	58,497	45,569	235,378	135,762	82,102	31,754	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	71,570	62,298	77,699	62,162	347,555	229,026	158,238	69,922	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	56,831	48,168	58,497	45,569	235,378	135,762	82,102	31,754	0	0	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	3.60%	3.60%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

Project Reconciliation

Project Completion Date Changes:

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Project Reconciliation

Previously Projected End Date of Project: 9/1/2023

Current Projected End Date of Project: 9/1/2028

Explanation of Project Completion Date Difference (if applicable):

Due to funding shortfalls in FY00-FY06, this project completion has been delayed.

Project Cost Estimates (in thousands of dollars)

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	893,055	**Actual 1997 Cost:**	22,771	**Actual 1998 Cost:**	22,933
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	847,351	**Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):**			22,878
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	870,229				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):	170,000	Salt Processing Upgrades scope now included in Salt Dispositon, SR-HL13.
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):	21,000	Delay in HLW program requires tank mods. to allow for additional storage.
Cost Growth Associated with Scope Previously Reported (+):	283,690	Undefined cost efficiencies removed until tech. to accomplish is available.
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	1,004,919	
Additional Amount to Reconcile (+):	-1	
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	**1,004,918**	

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
COMPLETE FIXED PRICE CONTRACT FOR TANK 11 TITLE II DESIGN	SR-HL12-991		8/1/1999								

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Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
COMPLETE TANK 8 CONSTRUCTION AND TURNOVER TO OPERATIONS	SR-HL12-990		4/30/1999								
Completion of Project	SR-HL12-280		9/1/2028								
Project Start	SR-HL12-001		10/1/1996								

Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critial Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
COMPLETE FIXED PRICE CONTRACT FOR TANK 11 TITLE II DESIGN	SR-HL12-991										
COMPLETE TANK 8 CONSTRUCTION AND TURNOVER TO OPERATIONS	SR-HL12-990										
Completion of Project	SR-HL12-280				Y						
Project Start	SR-HL12-001			Y							

Technology Needs

Site Need Code: SR99-2028

Site Need Name: Alternative Waste Removal Technology

Focus Area Work Package ID: TFA-1

Focus Area Work Package: Required Steps to Tank Closure at Hanford, ORR, Idaho, and SRS

Focus Area: TFA

Agree with Technology Link: N

Benefits (Cost, Risk Reduction, Both): Both

Technologies | **Cost Savings (in thousands of dollars)** | **Range of Estimate**

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Technology Needs

SaltCake Dissolution	60,000	Low